OFFICE COPY

CACTUS AND SUCCULENT JOURNAL

Of the Cactus And Succulent Society Of America

Vol. XII OCTOBER, 1940 No. 10

Mammillaria sonorensis var. *Maccartyi* x 0.7
Photo by Dr. R. T. Craig. See page 155.

CACTUS AND SUCCULENT JOURNAL

Published and Owned by the Cactus and Succulent Society of America, Inc., Box 101, Pasadena, California. A monthly magazine to promote the Society and devoted to Cacti and Succulents for the dissemination of knowledge and the recording of hitherto unpublished data in order that the culture and study of these particular plants may attain the popularity which is justly theirs. Subscription $3.00 per year. Foreign $3.00 per year by international money order. Membership in the Cactus Society free with subscription. Mail application to SCOTT HASELTON, *Editor*, Box 101, Pasadena, Calif. *Editorial Staff*: THE ENTIRE SOCIETY. Entered as Second Class Matter at Pasadena, Calif., under act of March 3, 1879.

Vol. XII OCTOBER, 1940 No. 10

Mammillaria sonorensis sp. nov. ..... Dr. R. T. Craig 155
Kitchingia, Bak. ..... J. R. Brown 157
Colorado Cacti, by Dr. C. H. Boissevain ..... Center Section
A New Species of *Graptopetalum* ..... E. J. Alexander 161
Grafting Column ..... Frank R. Mark 164
Society Members Who Welcome Visitors 166

ANNUAL MEETING OF THE NATIONAL SOCIETY

On Sunday afternoon, October 27, the annual meeting of the Society will be held at Johnson's Cactus Gardens, Hynes, California. From one o'clock until two-thirty, coffee and *Canis caliente* will be provided for all members and visitors, without charge. You are asked to bring your coffee cups and such additional items as you may wish to supplement your lunch.

At two-thirty a short meeting will be called to hear the report of the nominating committee; additional nominations can be made from the floor. Short reports on the progress of the Society and plans for the future will be heard.

Mr. Harry Johnson will give the talk of the afternoon and those of you who have not heard Mr. Johnson will realize what you have missed by not hearing him before. He is always an interesting speaker and on this occasion will outdo himself. We hope to view his fine collection of color slides now being used throughout the country as part of a lecture series.

Both during the luncheon period and after the meeting, the members will have an opportunity to see the hundred thousand rare plants in the glass houses and cold frames and to purchase if you wish.

Three valuable plants will be given as door prizes.

TIME: October 27, noon.

PLACE: Johnson's Cactus Gardens, 15 miles southeast of Los Angeles near Long Beach. If in Los Angeles, drive out Alameda Street to town of Compton. On main street of Compton (Compton Blvd.) turn left (east) about three miles to Garfield Avenue, after crossing bridge over Los Angeles River, then right (south) a mile or so to the Nurseries, on Garfield Avenue between Olive and Artesia Streets.

VISITORS: The Affiliated Societies and their friends will meet with us. Let's make this a memorable meeting.

Our price list is now ready for distribution. Gives blooming period and color of flower of each variety. Also some very attractive offers. Wholesale and retail. Drop us a card for our list.

A. R. DAVIS
P. O. Box 167, Marathon, Texas

MEXICAN CACTI
AND OTHER SUCCULENT PLANTS
Specialty: Specimen and Show plants. Business is done strictly in accordance with the Mexican Cactus Law.
FERDINAND SCHMOLL
Cadereyta, Qro., Mexico

MISSOURI CLUB FORMING

"I would like to contact anyone within a reasonable distance of Kansas City, who would like to see a Cactus and Succulent Society organized for this district." Robert Rose, 559 Evanston Avenue, Kansas City, Missouri. Telephone Independence 5841.

NEW JERSEY CACTUS SOCIETY

Sixteen enthusiastic members report that their group is still growing. One of their members traveled a hundred miles to attend the meeting. Howard O. Bullard has promised us a full report in the near future.

MIDWEST CACTUS AND SUCCULENT SOCIETY OFFICERS

President, John Bock, Sharon, Pa.; Vice-President, Kenneth Kline, 1365 W. 111, Cleveland; Secretary-Treasurer, John E. Rodgers, 312 Alexander Ave., Lorain. Dr. James F. Machwart of Parma Heights is Program Chairman.

MASSACHUSETTS MEMBERS

Please communicate with Vincent Mason, 96 Cummington St., Boston, regarding the formation of a local cactus society. Enjoy the association of friends who speak the same language.

Mammillaria sonorensis sp. nov.

By Dr. R. T. Craig

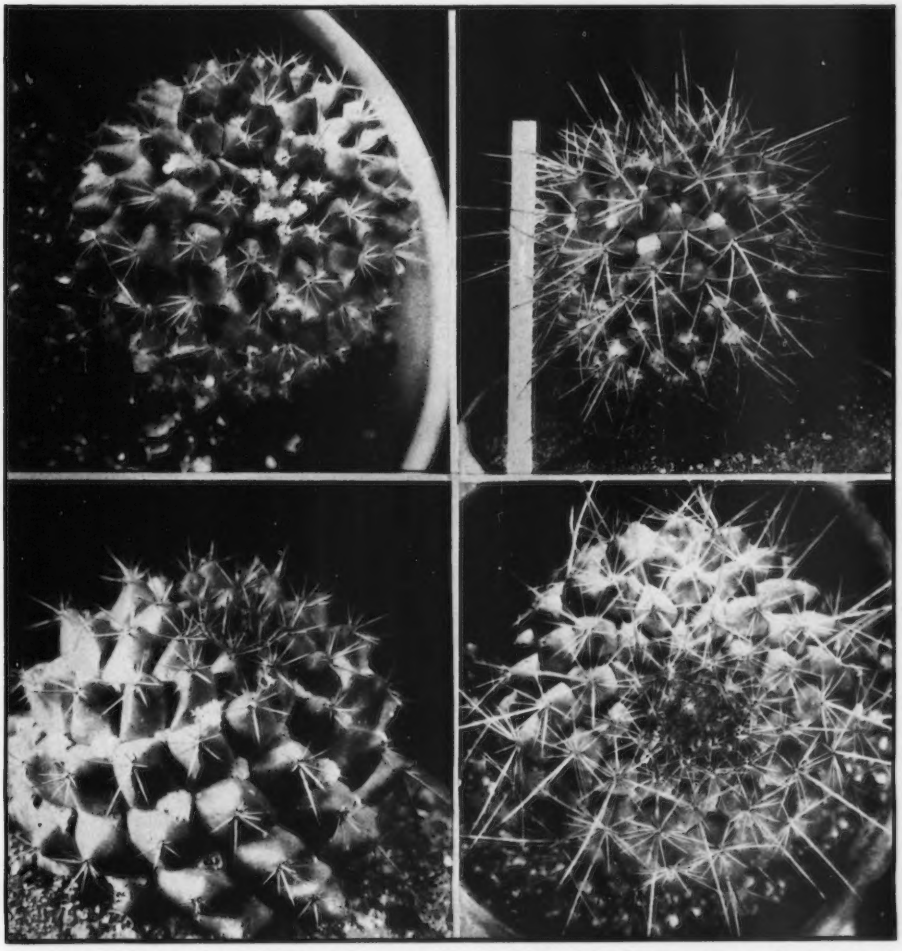
Corpus simplex et caespitosum; mamillae globosae aut quadrilaterae, non angulares, sucus lacteus; axillae, laneae, sine setis; spinae centrales 1-4 mutabillissimae, 5-45 mm., rectae, spadices; spinae radiales 8-15, 1-20 mm., aciculares, albae apicibus fuscis; flores campanulati, sepalae virides olivaceae, lanceolatae, serratae, acuminatae; petalae puniceae, lanceolatae, acuminatae, integrae; stigmata 7, viridia olivacea; fructis coccinea, clavata; semina fusca.

Body simple or cespitose from the base, globose, apex sunken.

Tubercles firm, dull bluish green; globular quadrangular, not sharply angled, keeled ventrally; sap milky; length 8-15 mm., width at base 8-18 mm.

Areoles oval, white woolly in youth, soon naked.

Axils tufts of white wool, occasionally a few scattered hairlike bristles, not a constant characteristic as different heads of the same cluster may or may not have them.



Varieties of *Mammillaria sonorensis*: Top left, var. *brevispina* x 0.8. Top right, var. *Gentryi* x 0.4. Bottom left, var. *Hiltonii* x 0.8. Bottom right, var. *longispina* x 0.7. Photos by Author.

Central spines 1-4, length extremely variable 5-45 mm., acicular to subulate, straight or sometimes curved, stiff, smooth, base enlarged; reddish brown; porrect to divergent, upper ones subcentral.

Radial spines 8-15, 1-20 mm., upper ones shortest, (slender acicular to stout acicular), straight, stiff, smooth; whitish to cream to reddish brown at tips; slightly ascending.

Flowers March and April, 20 mm. long, campanulate.

Outer perianth segments brownish olive green, wide tapering mid stripe, deep pink margins; lanceolate to ovate, tip acuminate, margins serrated to long ciliate.

Inner perianth segments deep pink, darker fine mid line, especially ventrally; linear lanceolate, 2-2½ mm. wide, tip acuminate, margins entire or finely serrated, ends split.

Anthers yellow to orange.

Filaments pink to reddish purple.

Style green to pinkish above.

Stigma lobes 7, olive green, 2½ mm. long, just above the anthers.

Fruit scarlet, clavate.

Seed brown.

Roots fibrous.

Distribution: S. E. Sonora, N. E. Sinaloa, S. W. Chihuahua.

Type locality: S. E. Sonora near Guirocoba (S. E. of Alamos).

Varieties of **Mammillaria sonorensis**

v. *longispina:* Central spines 3-4, to 35 mm., acicular; radial spines 14-15; tubercles small 10 mm. in diameter, from Rio Mayo.

v. *brevispina:* Central spines 1-2, 8 mm., slender acicular; radial spines 8; tubercles small 7-8 mm. in diameter, from Guirocoba.

v. *Gentryi:* Central spine 1, to 45 mm., subulate; radial spines 9; tubercles large, 16 mm. in diameter, from Rio Mayo.

v. *Hiltonii:* Central spines 1-3, to 14 mm., subulate; radial spines 7-8; tubercles large 16 mm., in diameter, from Guirocoba and San Bernardo.

v. *Maccartyi:* Central spine 1, to 20 mm., stout acicular, strong recurved dorsally; radial spines 8-10; tubercles large to 15 mm. in diameter, from Guirocoba.

This species was first collected by Howard S. Gentry in southern Sonora in 1933-34; later by W. T. Marshall in 1935; by George Lindsay in 1938, 39, 40; by Dr. R. T. Craig in 1937, 38, 39, and also from Sinaloa and Chihuahua in 1939. This species is extremely variable in size and length of spines and size of tubercles, but when the different variations are arranged in progressive order, the grading from one to the other can easily be traced but the two extremes are so different that they could very easily be classed as several separate species if it were not for the interlinking connecting variations. They could hardly be classed as separate species when the habitat conditions are known, because the different variations are found growing together in the same area but sometimes under slightly different conditions of soil, shade, moisture and other conditions of protection of rocks, trees, etc.

Type specimen deposited in U. S. National Museum Herbarium as *Mammillaria sonorensis*. No. 1,791,488.

From So. California Cactus Exchange Bulletin

In the November issue of the Journal, on the page conducted by Frank Mark, is an article entitled "Tin Cans vs. Clay Pots." The advantages of both cans and pots are pointed out in this article, and they both have good points. One source of supply for cans is the No. 2½ can from your grocery shelf. This can is the same in diameter as a quart oil can and only slightly shorter. The paper label is easily removed and can be dipped or painted and ready for service. Another can, that I use a lot of, is the one pound coffee can. Some plants, such as Echeverias, root shallow and do not require a deep pot or can. I am partial to pots and sometimes I paint them and by so doing I make them non-porous and overcome the moisture question. If one uses pots and wants to dip or paint them, the work has to be done twice to insure a good job. A new pot will absorb the first coat and look very bad, but a second coat will be smooth and glossy and easy to keep clean. An easy way to paint pots is to drive a stake in the ground for each pot you are painting. Hold pot in left hand and paint inside and as much of outside as you can and not paint your fingers, then hang pot on stake and complete the job. Repeat this operation next day and you will have a nice glossy pot without fingermarks. Some may ask why bother with cans or pots? Plant in the ground and you will not need them. Personally I like to have my choice plants in cans or pots so I can have better control over the pests that we have to contend with both above and below the ground. To enjoy the beauty of a plant, you must be close enough to see it well and if you wear glasses that means within reading distance, so that is a good argument for cans and pots.

KITCHINGIA, Bak.

By J. R. BROWN

In a paper published in the *Journal of the Linnean Soc.* XVIII (1881) 264 and entitled "Notes on a Collection of Flowering Plants made by L. Kitching, Esq., in Madagascar in 1879," Baker erected a genus to include 2 plants found in this collection and named the genus *Kitchingia* in honor of the collector, Langley Kitching of Leeds, who made an extensive missionary tour in Madagascar in 1879.

Baker gives the characters of the genus in the following terms, "Succulent perennial glabrous herbs, with flexuose stems, numerous opposite sessile or petioled crenate fleshy cauline leaves, and large bright-red flowers in lax terminal cymes. Allied to *Bryophyllum,* from which it recedes by its small calyx and divergent carpels."

The 2 plants named by Baker were, *Kitchingia gracilipes* and *K. campanulata,* and a plate illustrating the first named is also shown, and an exact photo. reproduction of this plate is presented here. *K. gracilipes* is an epiphytic Kitchingia and should not be viewed as representative of the habit of the entire genus, as all the other spp. seem to be of a more or less shrubby habit. Berger enumerates 7 spp. and they are all native to Madagascar.

The essential feature of the plate showing *Kitchingia gracilipes* in fig. 3, showing the spreading carpels, as it is this character which distinguishes *Kitchingia* from both *Bryophyllum* and *Kalanchoe,* as in these genera the carpels are united. In its pendent flowers, *Kitchingia* is closer to *Bryophyllum* than to *Kalanchoe.*

The name Kitchingia has been used rather widely in California for other plants of the *Kalanchoideae,* more especially for *Kalanchoe beharensis* which is often found under the mistaken name of *Kitchingia mandrakensis.*

The only known Kitchingia commonly in cultivation in this country is *Kitchingia peltata,* Bak. and while this plant has been in cultivation for several years, very little was actually known of its true relationship until recently. The *National Horticultural Magazine* in the issues of Jan. and April, 1939, published 2 very interesting and finely illustrated articles by Claude Hope, the 2 articles were respectively entitled "Kalanchoes for the Window Garden" and "Some Bryophyllums and a Kitchingia." In the latter paper a photo of the inflorescence and part of the stem of *Kitchingia peltata* is shown and for the first time definite information of a Kitchingia being in cultivation in this country was available.

Previous to the publication of the above article it had been found, while trying to assemble material about succulent plants in general, how little was actually known regarding many of them, the names being taken more or less for granted, the name Kitchingia being among them and so it seemed that, the only way to obtain definite details of the flowers of *K. peltata* was to grow a plant with this end in view.

A vigorous cutting was taken in the early spring of 1939 and quickly rooted in the sand bench, this was potted in an 8-inch pot and grown in a lath house close to the sunny side. This plant eventually reached a height of 4 ft. from the ground to the top of the inflorescence and showed no branching until after the flowering period, which occurred during March and April, 1940. The photo shows the upper 15 inches of this plant in flower.

This Kitchingia has very attractive foliage and bushy plants can be grown by pinching, but it seems to be somewhat weak-stemmed as a greenhouse plant. It would seem however, that to be at its best it should be planted outdoors in a frost free location and given some protection from extreme sunshine, under these conditions the comparatively thin stems stand erect and are able to hold up the large inflorescence and show the flowers to the best advantage. This Kitchingia will endure amazingly dry and sunshiny conditions, but of course, does not look too happy under such conditions. The flowers are much deeper in color when developed outdoors.

The photo. illustrating *Kitchingia peltata* shows part of the plant approximately x 0.4 and details of the flower nat. size. One flower is opened to show the white, flattened filaments which are attached to the perianth tube. The diverging carpels with the long, very slender styles are shown also.

A few brief details of this plant are also given. Lowest leaves 7 cm. long, 4 cm. wide, with reddish-brown crenate margins, petioles 4.5 cm. long, terete, reddish-brown. Flowers 3 cm. long, pedicels to 2 cm. long; the white flattened

J.G.Baker LINN.SOC.JOURN.BOT.VOL.XVIII.PL.VII

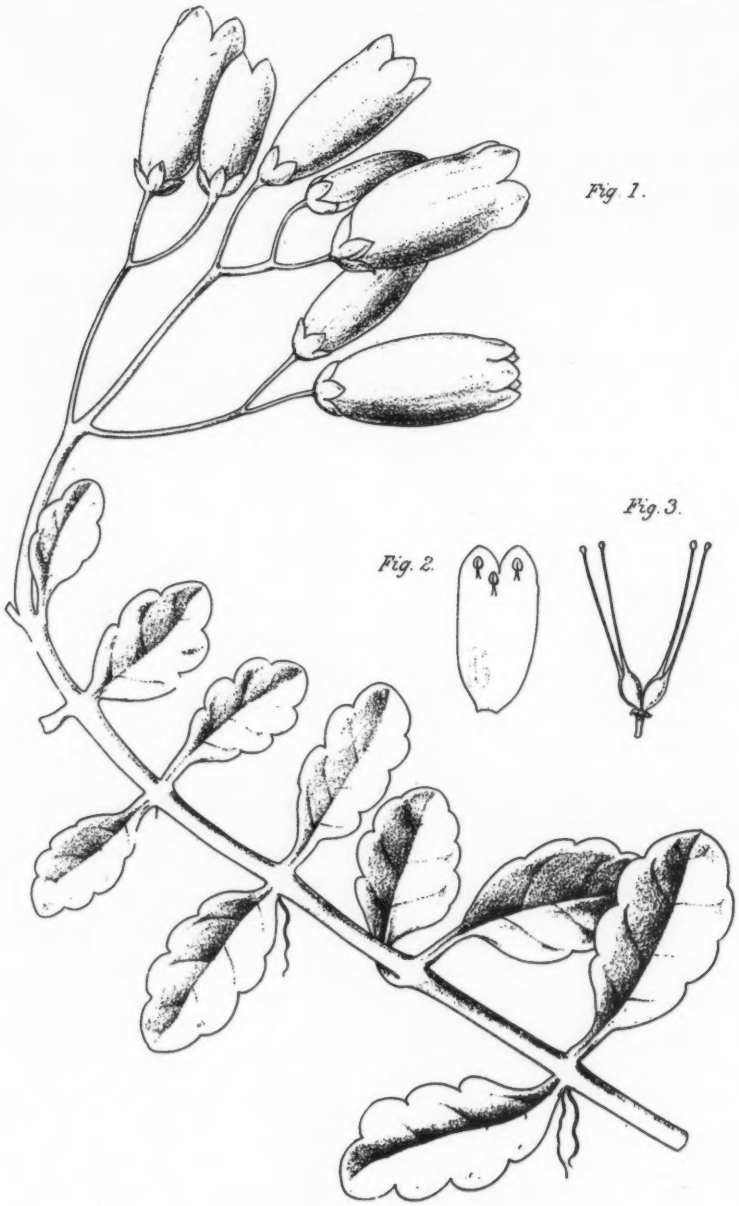
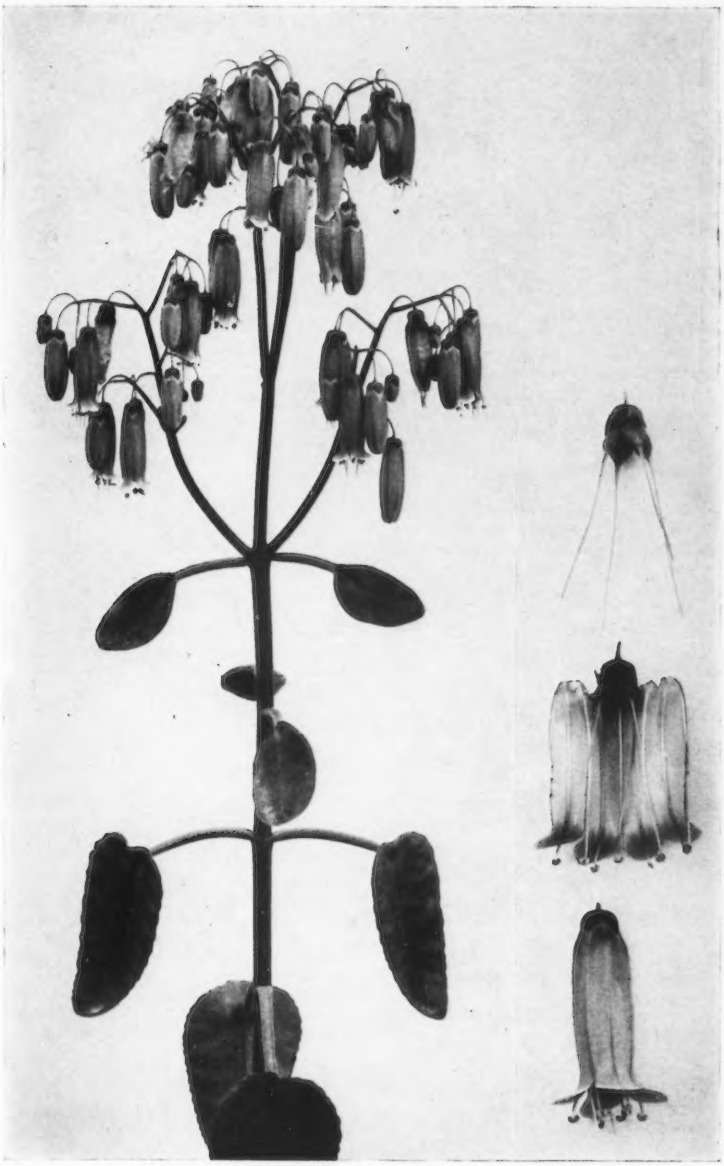


Fig. 1.

Fig. 2.

Fig. 3.

J.N.Fitch lith. KITCHINGIA GRACILIPES, *Baker*. Fitch imp.



Kitchingia peltata Bak.

filaments are attached to the perianth tube.

It should be remarked here, that there is a plant, *Bryophyllum uniflorum,* fairly well known in succulent plant collections, and which is very similar to *Kitchingia gracilipes* in general appearance even to the small calyx, and thus a small calyx does not aid in the determination of the genus *Kitchingia.*

FROM CANADA

I was very much interested in the experiments conducted by Mr. Herman Tobusch, of Villa Park, Ill., as recorded in his article in the August issue of the CACTUS AND SUCCULENT JOURNAL last year. Having a number of seedlings about the size of peas at that time, I located a glass bowl and found a suitable lid (pyrex casserole lid which fits tightly).

I started my plants in September, 1939. They included: *Coryphantha Palmeri, Echinocactus recurvus, Echinocactus Grusonii, Ferocactus corniger, Oreocereus Trollii, Astrophytum myriostigma* and *Mammillaria candida.* They were planted in a mixture of garden loam, sand and ground charcoal, about equal parts. This was placed over a one-inch layer of charcoal and watered before planting. The bowl was kept in a south window with full sun exposure and was given a very small quantity of water once a month.

The plants commenced to show new growth almost immediately. Then in November, I began to have trouble with green algae. It was quite bad in December and I wrote Mr. Howard Gates and asked him what I should do about it. I had in the meantime become convinced that all my soil should have been sterilized. However, he told me that was not sufficient to overcome the algae and suggested that I cover the entire surface of the soil with one-fourth of an inch of powdered charcoal.

I repotted everything late in January, using sterile soil, and this time added cuttings of *Chamaecereus Silvestri, Mammillaria pusilla, Mammillaria fragilis* and *Echinocereus leptacanthus,* none of them over one-half an inch tall. I had had two casualties in the original group, which I blamed on the algae. I also covered a clay pot of six seedlings with an inverted glass bowl and this has worked very well, too.

The plants are all doing very well and really you cannot describe their beauty. Don't laugh at my saying that the plants themselves are beautiful, because they are. The whole body of all these plants is a lovely shiny green and they are so plump that it is almost insulting to say they look healthy. Even the spines have extra color. At this date, May, 1940, *Cleistocactus Straussii* is two inches high and seven-eighths of an inch across and top heavy; *Astrophytum myriostigma* is one and one-eighth inches high and three-fourths of an inch across—I have two of these; *Echinocereus leptacanthus* is two and three-quarters inches high and has two new shoots; *Mammillaria fragilis* is one and five-eighths inches high and seven-eighths of an inch across, with five new offshoots; and *Chamaecereus Silvestri* is four and one-fourth inches high, five-eighths of an inch across, with two new shoots. This will give you some idea of the growth they have made. *Chamaecereus Silvestri* has almost hit the top of the bowl, and several of the others are touching one another. Much as I regret it, they will have to be moved soon. I have had no further trouble with algae.

I made another experiment late in April. I had a two and one-half inch plant of *Coryphantha macromeris* which I bought two years ago and which had never grown. In a rash moment I had cut off all the roots, hoping to force it but had not been able to start it at all. The plant was quite soft and a poor color. I planted it along with two cuttings of *Neolloydia texensis* which had also had this hard treatment but which were not soft. They were planted in the large bowl with the other seedlings. By May 10 they were all growing and I had to remove *Coryphantha macromeris* because I was afraid it was going to burst. It was well rooted and has continued to grow since its removal. It has two new tubercules already and is quite solid.

To get back to my regular collection of cacti. All the plants which I planted out in the rockery two summers ago have root mealy bug and I don't seem to get rid of it. I have tried Black Leaf 40—Volck—and the hot water treatment with very little success. For one thing, I can't seem to get the water solutions to wet the white down which is on the roots and lower bodies of the plants. I would certainly appreciate some good advice.

MRS. C. CRAVEN.

FORCING KALANCHOE WITH DARKNESS

From *"Horticulture"*

It has long been known that plants can be brought into flower before their natural flowering time by prolonging the days with artificial daylight. Plants that blossom in spring when the days have twelve hours of sunlight can be made to flower at an earlier date by increasing the days with artificial light to equal these twelve hours; those that bloom in summer when there are 16 hours of sunlight by increasing it also to correspond to this amount, etcetera. It has recently been discovered that plants that bloom after the turn of the year, when the days are short, can be brought into flower by shortening the days.

Kalanchoe coccinea, a good winter-flowering plant that blooms for many weeks usually flowers in late January or February and has always been desired as a Christmas-flowering plant because the clusters of brick or dark red flowers are ideal for Christmas decoration.

These plants have been brought into flower successfully as early as the first of November by covering them with dark cloth, which is applied over the plants late every afternoon. On each successive day the cloth should be applied a little earlier, this in imitation of the shortening of the days, as in November and December.

Several weeks of this procedure in August or September and the plants are literally misled and believing the year is coming to a close they send out their many flower buds after which, of course, the cloth is entirely removed and they are allowed to flower naturally.

This treatment is unique, as it is the exact opposite of previous experiments and has been entirely successful. It is possible that Freesias, Dutch Irises and other plants that bloom in January and February may also respond to this treatment.

If you have Kalanchoes and wish to have them in flower for Christmas, try this experiment. Any covering that shuts out the daylight will suffice.

JOSEPH A. HREN.

NAMING CACTI

A new book by W. Taylor Marshall and T. M. Bock is now in production. This book will contain illustrated keys so that comparisons of all genera will be understandable by the amateur. This volume will contain a review of all of the new species since *The Cactaceae* was published and will make the necessary changes in Britton and Rose classification. In other words, this is the companion volume to *The Cactaceae* and extends the classification of cacti to 1940. A prospectus will soon be mailed describing this new book and Society members can save 20% by taking advantage of the pre-publication offer.

The following 8 pages are the 6th Installment of the Monograph "Colorado Cacti" by Dr. C. H. Boissevain.

Graptopetalum MacDougallii Alexander, sp. nov.

A New Species of Graptopetalum

By E. J. ALEXANDER

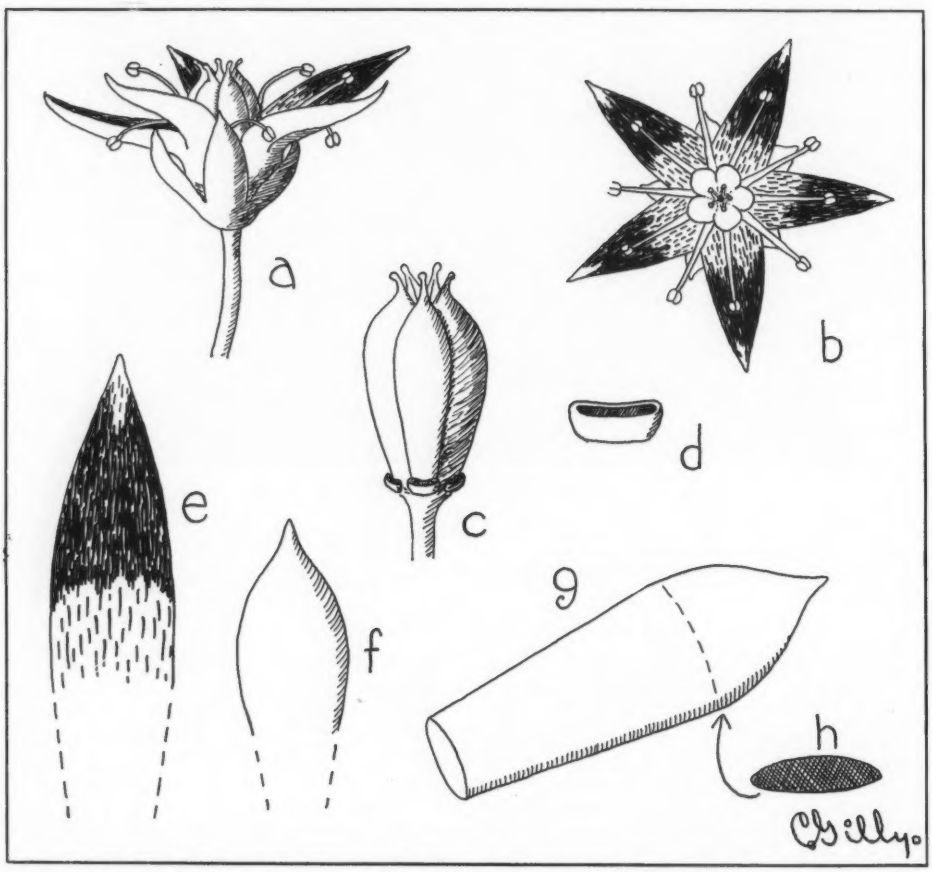
Among a number of Crassulaceous plants sent to the New York Botanical Garden by Mr. T. MacDougall while on his 1937-38 trip to southern Mexico was an *Echeveria*-like plant with very glaucous, acute leaves which could not be placed definitely with anything it resembled. The flowering of this plant the past winter has allowed for its identification as a *Graptopetalum* in which genus it is without question a new species and which the writer herewith names in honor of its collector:

Graptopetalum MacDougallii Alexander, sp. nov. Planta acaulis; foliis conferto-rosulatis, 3-3.5 cm. longis, oblanceolatis, apicibus apiculatis abrupte; scapis lateralibus, 10-12 cm. altis, paniculatis, ramosis secundis, scorpeoideis, 4-12 floribus; pedicellis 10-20 mm. longis; sepalis ovatis, acutis, 6-8 mm. longis; corollis 10-14 mm. longis maculato-striatis tubo breviore calycis; carpellis obovoideis, turgidis, dorsualiter attenuatis abrupte, stylibus erecto-patentibus.

Plant acaulescent, increasing by axillary stolons and basal offshoots. The strongly glaucous leaves are densely rosulate, lingulate, and abruptly

tapered to a short acuminate tip, flat above, somewhat convex below, up to 3.5 cm. long and 1.5 cm. broad, spreading when in growth but drawn up into semi-rosebud form when dormant. Inflorescences numerous (13 on type plant), cymoid-paniculate, the branches secund and scorpioid. The pedicels are up to 2 cm. long and supra-axillary. The calyx is up to 10 mm. long, the lobes 6-8 mm. long, united below, ovate and tapering to an acute apex. The corolla-lobes are ovate-lanceolate, acuminate, green without and strongly keeled, with a few red striae near the margin; the tube is 3-4 mm. long, whitish yellow-green within, the lobes 7-10 mm. long, the free portion maculate-striate with maroon streaks, these scattered below, coalescing near the center and spreading again forming a yellowish green area in and near the apex. The stamens are 10, the five alternate with the petals free above the corolla-tube, their filaments subulate, 5-8 mm. long, greenish white, tinged reddish apically; those opposite the petals adnate to the corolla-lobes 1.5-2 mm. above the tube and somewhat flattened at the point of adnation. The anthers are red-brown, oblong, 1 mm. long. The nectarine scales are dull buff, 1 mm. long and 1.5-1.8 mm. wide. The carpels are united below the middle, the entire cluster 6-7 mm. long, obovoid in outline, the individual ones obliquely half obovoid, abruptly tapering to a flesh-pink, erect-spreading style. Mature fruit not yet known.

Type collected in the state of Oaxaca, Mexico, by T. MacDougall in January, 1938, and flowered in the conservatory of the New York Botanical Garden in January, 1939. Specimen de-



Graptopetalum MacDougallii. Explanation of Plate: (a) Flower x 2; (b) face view of flower x 2; (c) carpel cluster x 4; (d) nectary gland x 10; (e) petal x 4; (f) sepal x 4; (g) leaf x 2; (h) cross-section of leaf x 2.

posited in the herbarium of the New York Botanical Garden.

Mr. MacDougall obtained the cuttings from which the plant was grown in the mountains west of Tehuantepec, above the village of Tenango. The plants grew in thin soil on rocks in partial shade, forming large carpets such as are formed by Sempervivums.

E. J. ALEXANDER

New York Botanical Garden, March, 1940.

FROM DEUSBURY, YORKSHIRE, ENGLAND

I do like to receive your magazine. It is so very pleasant to know that somewhere there is a country where sooty fog, rain and frost are not the order of the day for about a third of the year. I envy California its climate. I live, you see, on the bleak moors of the Pennines in an industrial area and I can guarantee that, if any part of the British Isles is getting bad weather, this town is in the middle of it. The effect on plants is often disastrous, so I am afraid any suggestions I can make can be of no use to anyone. I do get plenty of experience of various kinds with my plants, but I think they must be the most disillusioned cacti on the earth. Still, some of them survive, only I dare not buy any of the attractive, rare varieties, they would soon die. So I have to satisfy myself with hardier varieties that have been proved by experienced growers in England. Even those don't always survive because many English growers live in the south where they get little more sun than we do.

Then, too, my greenhouse is badly situated, for it gets not one flicker of sun from October to March. This causes the plants to start growing late in spring. For instance, two years ago, when there was very little sun they showed no growth until late June or July, whereas last year when there was good sun in April I actually had 6 varieties in bloom before the summer ended. Believe me I was proud. I can get my Phyllocactus to bloom with one or two flowers every year and last summer I showed everyone a nine-inch bloom next to four tiny flowers on a tiny *Rebutia minuscula*. That may sound very small to a Californian used to every variety of cactus in bloom, but cacti are not common in this part of England. I only know of about six people who grow them seriously in this neighborhood, consequently the legend about them only blooming once in twenty or once in thirty years is quite common. The average person who sees my plants generally says, "Well, I can't see anything in them, they're funny looking objects and I'd rather grow something useful, like tomatoes." When I show a nine-inch highly colored red flower, the sceptics have to concede there may be something in cacti. This last summer I was very pleased to see my *Gymnocalycium* in bloom, that is the latest addition to my flowering plants. For two years in succession an *Astrophytum* and *Gymnocalycium Andraea* have got as far as budding, but since the buds showed as late as August nothing came of them.

As well as lack of sun my plants suffer from another drawback—the atmosphere. About 3 years ago my greenhouse was painted a nice bright green, but before six months were ended it was an equally bright blue. That is what a manufacturing atmosphere can do. How can plants grow in that?

My greenhouse is only a tiny one containing some 200 plants, but it keeps me busy—sometimes it saddens me. As for example, when an old gardener said he would give me some fine old sods off his allotment—good soil—been standing at least two years. I used it; so did he for his tomatoes. There was scarcely a whisker of growth on my cacti that year and never a tomato on his plants. I carried out a searching examination into the original home of that soil and discovered it came off the top of an old coalpit head. I am much more particular about my soil now. I lost several plants that season. You would probably be astonished at the little growth that my plants produce in a season, but I do know when they grow, the old part is so dirty and the new part so clean. I wish my *Mammillaria plumosa* could be kept clean, but the sooty fogs make it impossible. My plants are like those trees (I cannot remember the name) where rings on the bark show years of growth, only in my case rings of dirt give the age.

Some day I shall visit Central America to see the cactus in its real home and then I shall come back to England and never again try to grow another cactus—I shall probably take up turnips or tomatoes—I shall be as disillusioned as my 200 small cacti are today. I shall then become an armchair cultivator reading your magazine and all the authorities an Cactus Cultivation and saying what I would do "if only."

MISS E. M. CRANKSHAW.

WHAT GOT YOU GOING?

Every cacti bug who ever had an introduction to a cactus spine has heard this from time to time. I have often sat among my precious pets (yes, and literally fell in the middle of one, once, producing an hedgehog effect on neck and face) and tried to figure out the magnetic power that, as long as you live, rivets the collector.

Being 74 this month of July, I cannot remember, however young I was, that my eyes did not behold a cactus, for my father, before I was born, collected them in London. Later on, in his greenhouse, I saw him watching them for hours as he sat on a high stool, as if they had some magnetic power he could not resist. When they flowered, all the neighbors had to know it.

If he was *very* quiet, sitting there, he was busily engaged divorcing spines from his anatomy. Dared not tell my mother, for no sympathy ever came from that quarter over those "beastly things."

For three years I lived in Missouri, and would have liked to kick every plant out of the garden to put in a cactus. I went to Dallas, Texas, to McAllister (then Indian territory), and was ever cacti-minded. No sooner did I enter a city or town than I asked where to see, or find some cacti. Most people thought I was "Gone With the Wind," or some other form of insanity.

While in Dallas I saw some fine cactus apples for sale, 5 cents a dozen, and pinched one to see if it was ripe. How thankful I was that I had not bitten one to find out. I learned, as the song says: "If it doesn't concern you, let it alone."

What has kept alive this cacti spirit all these years? Has anyone ever heard of a cure?

JIM MARSH of "Cactus Mansion."

WASHINGTON CACTUS AND SUCCULENT SOCIETY OFFICERS

President, Mrs. J. W. Oakley, Seattle; Vice-President, Mrs. A. J. Cotton; Secretary-Treasurer, Mrs. R. R. Nichols, Seattle; Directors, Bert L. Williams, Mrs. V. W. Zatarain.

GRAFTING COLUMN

A department conducted by Frank R. Mark, 825 Elyria Drive, Los Angeles. Mail him your problems.

We have been told that "cristate" means crested, and that "crested" means having formed a crest. Also that this word comes from the Latin "crista galli" meaning a cock's comb. However, our dictionary, an ancient but authentic 30-pound variety, says that it means, in part, the "rising part of a horse's neck." Whether this horse has any connection with Harry Johnson's superlative mule, mentioned on Page 135, Vol. 12, or Mrs. Russell's much publicized two-headed calf, page 110, Vol. 12, or not, I do not know and care less. Anyway, I feel that all this friendly controversy over cristates has definitely stimulated interest in these remarkable growths, not only among amateurs but among old, seasoned collectors as well. Perhaps this accounts for the common expression so often heard recently that so many amateurs "start with Opuntias and end up as crest collectors." Since the first tirade was printed in the July issue it is particularly gratifying to note how so many loyal writers get up on their hind legs in defense of their noble art of grafting and propagating cristates and monstrose growths.

It is not the purpose of this article to present any new facts, or even theories on the subject of fasciation, but rather to sum up the consensus of opinion of some of our leading authorities on this interesting hobby. Neither is it my desire to take any part in the fasciation feud. On the contrary, I will ignore it, feeling that it is worse than silly to use page after page of this valuable publication to merely express one's preference regarding plants. It is neither instructive nor constructive and I think the readers will agree that the space could be used for better purposes. My one and only desire is to help the amateur in a practical manner to take care of and propagate his crests without trying to smother him with a lot of scientific but useless knowledge. I might add in this connection that I am of the opinion that many of our writers are inclined to lead the unsuspecting reader in over his head and then to drown him with botanical terms that he knows nothing of and cares less about.

Authors of cactus books and literature are devoting more space each year to fasciated plants or cristate forms. Prof. J. Borg in his latest book on cacti says that, "there is hardly a collection of cacti which is considered complete without a few examples of fasciation." Ethel Bailey Higgins, in her book *Our Native Cacti,* says, "these abnormal forms are rare and are accordingly prized by fanciers who count them as the gems of their collection." J. J. Verbeek Wolthuys in his excellent review *The Origin of Monstrosity and Crestation in Succulent Plants,* states, "Some people say that crests are ugly, but I do not agree. Cristate plants lose their well-known symmetry, such as is peculiar to cactuses. But, on the other hand, the twists and undulations of a crested cactus pleases the eye by a beauty all its own."

Cristates occur in numerous plant families, one of the most common being *Celosia cristate,* the well-known cock's comb, the seed of which has a very high percentage of ability to form crests. Crests are quite common in the *Euphorbia* and *Stapelia* groups, and also occur in the other succulents, such as *Echeveria,* etc.

So far as I have been able to ascertain, cacti cristates have been propagated for about 100 years and at the present time there are probably less than 200 species in cultivation. This list, of course, is being gradually increased each year as new species are either found in their natural habitat or occur in cultivation. Cactus authorities in general agree that the phenomenon of cristates or fasciation is caused by the growing bud or nucleus in the center of growth, dividing and subdividing itself and thereby causing a line of growth, or, in some cases, an irregular, monstrose growth. Continuing along this line of reasoning as to what causes the bud or cells to divide, it may be stated that all plant growth consists of the plant cells multiplying by dividing and re-dividing. This being the case, it would seem reasonable to assume that the formation of a crest or monstrose growth must start at this point and be due to a deviation from the normal cycle of growth.

As to what causes the deviation, some authorities feel that it might be due either to a more or less sudden access of nourishment or undernourishment, while others contend that it is possibly due to injury to the center of growth, mechanically, such as fire, insects, stock or birds. In defense of the former theory, one foreign author advocates the existence of certain substances which regulate the growth of various parts of the plant; therefore it is possible that the part of the plant which became monstrose may have been furnished an excessive amount of these mysterious substances. In a like manner, we may have these same substances to thank for some of our best crests dividing or forming heels; in other words, blocking off the line of growth similar to the action of leucocytes, or white corpsules, in blocking off the growth of bacteria in animal tissue.

In case of mechanical injury to the center of growth, it would not stretch the imagination to assume that in the process of forming new growth, an injured cell might not only divide and form an elongated or monstrose growth instead of the normal, but also exert some influence on the surrounding cells, either from an hereditary cause or an infectious manner, such as infected tissue in animals.

Dr. O. Penzig says in part, "—most hypotheses or theories have had no other result than the establishment of a fresh term, without radically solving the problem." From this it would seem that practically all theories regarding fasciation are more or less moth-eaten. However, all truths or sound theories are worth repeating. The sad part of the situation is this: A small minority of our writers are so thoroughly convinced that they know all the answers whereas our really great students of cacti freely admit that they know nothing.

Another eminent author on fasciation, Prof. Hugo de Vries, says, "there are races of hereditary crests producers and that heredity itself is sufficient explanation."

In summing up the opinion of the leading authorities, there seems to be a slight leaning toward the hereditary theory. However, Prof. Wolthuys ends up his conclusions with, "—to arrive at knowledge of the cause would not seem possible at present. . . . And I shall arive at the conclusion that we do not know anything about cristation." Our own genial president Marshall, when interviewed for his opinion on the subject, expressed himself as usual in his crisp but forceful manner, "While many theories," he says, "have been advanced as to the cause of fasciation, no facts to confirm these theories have as yet been recorded, and our total definite knowledge on the subject today is no greater than it was in the beginning."

The answer to the entire question, therefore, if you will pardon the opinion of a rank amateur, is that a solution must come from research by plant physiologists.

Crests might well be divided into three classes, or grades: regular, irregular, and monstrose, and designated by the initial of the descriptive adjective following the crest name, thus: *Lobivia Pentlandii* R. It must

be remembered, however, that in some species both a regular and an irregular strain appears; for instance, in *Neoporteria Reichei, Notocactus Ottonis* and *C. senilis*. Also, on my irregular strain of *C. senilis*, the wool is only three-eights of an inch long, whereas on the regular it is two inches long. Regular crests are described as growing very symmetrically and are not divided into sections of normal growths. This class would be represented by such crests as *Parodia microsperma, Mammillaria celsiana, Pilocereus polygonus* and *Parodia microthele* and would include possibly one-half of our very best crests.

Irregular cristates would include such plants as *Notocactus Ottonis, M. Parkinsonii, R. minuscula, Echinocereus chloranthus* and should be called such because of their disconcerting habit of not growing symmetrically, dividing into sections, or developing into a series of normal growths. This group of medium grade crests would include approximately one-fourth of our present group. They require much more work to maintain, but with sufficient care large specimen plants may be developed.

The remaining 25% would include such plants as *Trichocereus candicans, Echinocereus Berlandieri, Notocactus muricatus,* and nearly all the so-called *Opuntia* crests and all the *Piptanthocereus* group. In other words, it would include all the monstrose growths, plus the unsatisfactory crests. The irregular types usually develop into grotesque monstrosities and are not considered very attractive, whereas the ones developing a symmetrical line of growth gradually become wavy with a fanlike growth eventually assuming a more or less spherical shape consisting of a mass of crenulated, snake-like convulutions. These develop into beautiful specimen plants and are the ultimate objective of the crest collector.

The irregular and monstrose crests have more or less of a tendency to divide into sections or divisions, each section, of course, having a terminal of the line of growth at each end. This is sometimes called a dead end, but is more properly termed a "heel" and, unless it is removed, the growth will be very much retarded. When these sections develop it is best to remove them, cut off the heels, and regraft on new stock. Cut deep enough in from the heel to sever the center line of growth and your crest will then start growing longer.

In speaking of crests, length means the actual measurement taken along the line of growth, regardless of the many waves or convolutions. In other words, a crest may measure 30 inches long, yet in size and shape may not be larger than an average cantaloupe. Width in this case means the actual thickness of each wave or convolution, while diameter means the distance horizontally through the center of the entire plant. Diameter is particularly applicable to this measurement in a spherical or ball-shaped crenulated specimen; if the plant is flat or fan-shaped, "spread" expresses the same meaning and perhaps is even more descriptive. Height is seldom misunderstood. However, it applies to the crest only and not to the stock. In describing a grafted specimen the dimension of the stock should also be given, showing its diameter and height (the height in this case being from the surface of the soil to the bottom of the crest). Thus it will be readily seen that if crest collectors will all adopt the above method of measuring plants, it will greatly facilitate expressing our meaning to each other, especially when it is necessary to do so by mail.

Referring again to the size of the stock, I find it is the cause of a large percentage of disappointments among our propagators. Always use large stock, the larger the better. Nearly all crests grow much faster than the normal plants, which is proof in itself that the plant will not last long on a half-pint size stock. For some unexplained reason the stock will sometimes influence the spine coloring of the crest. I have run tests on several and find that the *Piptanthocereus* will bring out the spine color much better than *Trichocereus spachianus*. There is also something to this "incompatability of stock" theory. Any number of genera are practically worthless as stock, such as cylindrical Opuntias. On the other hand, some of our stock will take scions of some genera and refuse others. For instance, the common spineless Opuntias make excellent stock for *Epiphyllum, Rhipsalis, Echinocereus,* etc., but it is useless to try to graft a milky Mammillaria on it.

In cutting crest scions, a good rule for the beginner to follow regarding size is this: On crests less than one inch in width, cut them not less than one inch in length. On one to two inches in width, make both measurements equal. On crests more than 2 inches in width, 2 inches in length is sufficient, unless it is a very large crest. The standard terms among collectors in reference to crests are: a "cut" meaning an ungrafted piece of crest of approximately the minimum size as outlined above; a "grafted cut" as having been grafted and thoroughly knitted and established on suitable stock either rooted or unrooted, but not necessarily having started to grow; a "specimen" crest is understood as a cut that has at least doubled in size since having been grafted on suitable rooted stock.

In connection with the free grafting service, I receive *and welcome* considerable correspondence on cristates and grafting. One question often asked is, how to establish comparative values on crests for sale or exchange. There are two determining factors governing the value of any crest—its rarity and beauty, both of which are about equal in importance.

Assuming that a hypothetical crest is perfect, or 100%, may I suggest that you analyze the characteristics of these two factors in your crest, somewhat on the order as outlined below.

Rarity
50%

1. Age since first found.
2. How long marketed.
3. Rate of growth.
4. The ease of being grafted.

Beauty
50%

1. Symmetry Regular.
   Irregular
   Monstrose.
2. Size.
3. "Handle-ability"
4. Spines or wool and their color.
5. Flowers.
6. Width.
7. Color.

The rarity of the majority of crests, of course, is determined by their age and how long they have been available. Several factors such as slow growth, poor adaptability in being grafted, large size, etc., are often present in such plants as most of the *Ferocactus, Carnegiea gigantea, Lemaireocereus Thurberi,* and *Machaerocereus gummosus*. Crests of such plants will always be valuable regardless of age.

In addition to the apparent condition of the crest on which it is hardly necessary to comment, the factor of beauty can be also divided as outlined above, and in the probable order of their importance. The first item, symmetry, is again divided up as has been previously explained. 2. Size, of course, in this case means the height and diameter of the crest. 3. Handly-ability—if I may use the word, should be considered in any crest but is directed particularly against Opuntia crests, the glochids of which are obnoxious. They come in the monstrose group and are very unsatisfactory. 4. Spines or wool and their color sometimes really 'make' a crest, for instance, *Notocactus scopa* or any of the *Echinocereus* groups with pectinate spine clusters. Such crests are always popular regardless of age. 5. Many of our crests bloom and who could improve the looks of common *M. Wildii* or *M. Painteri* when they are covered with hundreds of tiny blossoms? 6. There are a few species in which the extremes in width make them unsatisfactory for propagation. Several are too wide, such as *Ferocactus,* etc., while a few are so thin that it makes them difficult to graft. 7. Color in some instances makes a crest very outstanding regardless of how long it has been on the market. For instance, *Lophophora Williamsii* when grown in the full sun takes on a color all its own, seemingly a mixture of red, purple and green. Another striking color to be seen in a crest is the intense green of *Notocactus mammulosus.*

Thus it will be seen that by grading your crests by percentage as outlined above, and by comparing both their merits and value in dollars and cents to a crest (which you are satisfied was priced about right), you will be able to arrive at a fair comparative value.

REAL COOPERATION

The K. I. O. reports the following amendment to their By-Laws.

"Full membership dues shall be $3.25 per year, payable in advance, except in cases where wife, husband, daughter, son, mother or father is a local member, in which cases the Full Membership dues shall be $3.00 per year, payable in advance, and shall include subscription to The Cactus & Succulent Journal."

If all groups followed this example, then the National Society would be able to enlarge its JOURNAL.

NEW OFFICERS K. I. O.

President, Jos. F. Schnurr, 3146 Rosina Ave., Latonia, Covington, Ky.

Vice-President, Rev. Neil E. Annable, 214 Washington St., Bellevue, Ky.

Treasurer, H. Ranshaw, 22 East 25th St., Covington, Ky.

Recording Secretary, Lloyd F. Combs, R. R. 13, Ayres Road, Cincinnati, Ohio.

Corresponding Secretary, Chas. R. Cole, 1797 Wm. H. Taft Rd., Cincinnati, Ohio.

Past-President, Geoffrey A. Gray, Bureau of City Tests, Campus Station, Cincinnati, Ohio.

ANNOUNCING

The Southwest Cactus Growers' Photographic Exhibit will be held November 9th, 10th and 11th, at the Manchester Playground, 8800 South Hoover St., Los Angeles.

If you have photographs that you would like to enter, please contact E. S. Taylor, Chairman Publicity Committee, 1707 Roosevelt Ave., Los Angeles, Calif.

Be sure to mark the date because the next issue of the JOURNAL will not be mailed until after the show dates.

WANTED

Cactus and Succulent Journal Vol. I, issues 6 and 9 (Dec., 1929 and March, 1930). We need two copies of each. Box 101, Pasadena. Will pay $1 each.

SOCIETY MEMBERS WHO WELCOME VISITORS

The following is a summary of the questionnaires mailed to all members of the Society. We appreciate the interest of those who answered our questions. The absence of replies from many of our best known members was somewhat of a shock (for instance, our own board members!). Your leniency is solicited if we have overlooked tabulating any questionnaires not included in this list.

All of the following members welcome visitors but in most cases it is desirable to make an appointment. The number of cacti and succulents in a collection does not necessarily mean different species unless marked "sp."

State	*City*	*Street*	*Name*	*No. Cacti*	*No. Succ.*	*Favorite Cactus*	*Favorite Succulent*	*Best flowering*
Calif.	Altadena	459 Royce	C. J. MacCourt	400	150	Cephalocereus	Lithops	Cereus?
Calif.	Antioch	310-4th St.	Paul Hutchison	250	750	Mammillarias	Haworthias	Hamatocactus setispinus
Calif.	Antioch	Box 52, R.F.D.	G. W. van der Bundt	300 sp.		Mammillarias	Stapelias	Trichocereus Schickendantzii
Calif.	Auberry		Mrs. Carl Strong	10	4			
Calif.	Colton	1148 N. 8th St.	O. D. Guire, Jr.	30 sp.	70 sp.			
Calif.	Corona	Hillside St.	Howard E. Gates	300,000	200,000			
Calif.	Los Altos	Rt. 1, Box 157-G	Holmes C. Miller			Pachycereus marginatus	Euphorbia splendens	
Calif.	Sacramento	3703 S. St.	Frank S. Curtis	380 sp.	55 sp.	Echinocactus Grusonii	Echeveria	Notocactus Haselbergii
Calif.	Hollywood	8148 Mannix Dr.	Thor M. Bock	200	75	All	Crassula arborescens	Opuntias

State	City	Street	Name	No. Cacti	No. Succ.	Favorite Cactus	Favorite Succulent	Best flowering
Calif.	San Diego	1976 Kearney Ave.	Wilbur H. Wier	10,000	250	All	All	
Colo.	Englewood	1101 E. Dartmouth	Miss Muriel Colburn	200	5	All		Echinocereus triglochidiatus
Conn.	E. Hartford	69 Bliss St.	Mrs. Lois B. Shaw	75	10			Opuntia compressa
Conn.	New Haven	285 Prospect	Ralph G. Van Name	300	200		Haworthias	
Ill.	Chicago	1523 Nelson	Mrs. P. L. Akins	50	6			Coryphantha
Ill.	Chicago	8954 Oglesby Ave.	Mrs. C. M. Hunter	175	140		Euphorbia grandicornis	Euphorbia splendens
Ill.	Chicago	822 Windsor	Mrs. Harry Osgood	250	200	Parodia mutabilis	Gasterias, Haworthias	
Ill.	Chicago	2907 N. Merrimac	Robert T. Van Tress					
Ill.	Amboy	317 W. Division	Prof. Arthur Blocher	500	50	Too many	Stapelias	Aporocactus flagelliformis
Ind.	Cayuga		C. E. Spellman	60	75	Epiphyllums	Haworthias	Echinopsis
Ind.	Burnettsville	Rt. 1	George W. Mitchell	2	9			
Ind.	Michigan City	W. Dunes Hi Way	Miss Ruby Joers	94	15	Echinocereus		Echinocereus
Ind.	Fort Wayne	307 Standard Oil Bldg.	R. H. Lahmeyer	125	75			
Ind.	Hammond	6535 Monroe Ave.	John Soderberg	150	25		Euphorbias	Epiphyllum Ackermannii
Ky.	Louisville	644 S. 4th St.	L. Eugene Johnson	40	300		Crassula	
Mass.	Cambridge	66 Sidney	John S. B. Morrison	25	15	Hamatocactus setispinus	Echeveria	Hamatocactus setispinus
Mass.	Newtonville	Box 91	Ray Lewis Quick	68	78	Ferocactus acanthodes	Dyckia sulpharea	Mammillaria prolifera
Mass.	Elmwood	35 East St.	Frank N. Houghton	165	105	Ariocarpus fissuratus	Euphorbia splendens	Bryo. diagremontianum
Mich.	Kalamazoo	915 Austin St.	Mrs. Alfred Mathews	50		Lophophora Williamsii		
Mich.	Ann Arbor	1403 Cedar Bend Dr.	Otto Laporte	30	100	Morawetzia doeltziana	Frithia pulchra	Drosanthemum speciosum
Mo.	Kansas City	559 Evanston Ave.	Quality Hill Cactus Home	350 sp.	300 sp.	Ceph. Palmerii	Euphorbia splendens	Hamatacactus setispinus
Minn.	Minneapolis	436 Upton Ave.	D. A. Brunson	300 sp.	20 sp.	Astrophytum	Euphorbia	Astrophytum myriostigma
Neb.	Omaha	4829 Ames Ave.	Rodney E. Akerstrom			Cephalocereus senilis	Euphorbia obesa	Bryophyllum tubiflorum
N. J.	Hawthorne	59 Maitland Ave.	John B. Snethlage		100 sp.	Euphorbias	Euphorbias	
N. J.	Montclair	254 Midland Ave.	Dr. Chester B. Allen					Lophophora Williamsii
N. M.	Albuquerque	Box 1251	W. D. DeLong					
N. Y.	Bronx	2348 University Ave.	Robert Mueller	70	15	Ferocactus		Echinopsis tubiflora
N. Y.	Durhamville	Center St.	Allen C. Tracy	100	18	Rebutia minuscula	Faucaria tigrina	Notocactus ottonis
N. Y.	Flushing, L. I.	4229-189 St.	Marie F. Becker	53	33	Cereus peruvianus	Euph. grandicornis	Ferocactus uncinatus
Ohio	Cincinnati	3401 Brotherton Rd.	Daniel Neumann	102		Notocactus		
Ohio	Cincinnati	1797 Wm. T. Taft Rd.	C. R. Cole	150	30	Many	Aloe vera	Opuntia compressa
Ohio	Cincinnati	1714 Wm. H. Taft Rd.	Albert Wehrenberg	20	8	Gymnocalycium	Faucarias	Gymocalyciums
Ohio	Marysville	310 W. 7th St.	Fred L. Way	45	65	Astrophytum	Stapelia	Opuntia (Florida)
Ohio	Lorain	312 Alexander	John E. C. Rodgers	540 sp.	120 sp.			
Ohio	Warren	917 E. Market	Mrs. F. S. Van Gorder	100	35			
Pa.	Pittsburgh	426 Coolidge Ave.	R. E. Birch				Haworthias	
Texas	Fort Worth	3032 Glen Garden Dr.	S. W. D. Hall	344 sp.			Haworthias	
Texas	Sinton		T. W. Knox	250	25	Woolly types	Euphorbias	
Wash.	Dieringer		Alfred S. Harmer	1300	4500		Echeverias	Xmas Cactus
Wash.	Seattle	1512 Nob Hill	Mrs. R. E. Eyler	200		Hairy	Aloes	Rebutias
Wash.	Seattle	1618-39 Ave.	E. F. Porter	300	100	Melocactus intortus	Euphorbia alcicornis	Euphorbia splendens
Wis.	Stevens Point		Jos. H. Martini	200		Ech. horizonthalonius		Opuntias
Wis.	Milwaukee	3285 N. 24th Pl.	Max F. Jaehnert	500	100	Too many	Aloe aristata	Zygocactus
France			André Bertrand			Rebutias	Haworthias	Rebutia aureiflora
	New Zealand	Auckland N2	Mrs. M. Waterman	750	750	Piptanthocereus	Bromeliads	Pleiospilos
Canada	Winnipeg	81 Kingston	Mrs. C. Craven	120	35	Astro. myriostigma	Stapelia grandiflora	Stapelia variegata
S. Afr.	Port Elizabeth	St. George Park	F. R. Long		1000's		Haworthias	

HUMMEL'S EXOTIC GARDENS
"The Cactus Emporium"
4848 W. Imperial Highway Inglewood, California

CRESTED forms have fascination. Try these:

Cephalocereus palmeri	$2.00
Cleistocactus strausii	2.00
Rebutia senilis	1.00
Mammillaria geminispina	1.00
Espostoa lanata	2.50
Mammillaria Zeilmanniana	2.50

EXPRESS COLLECT

SPECIAL THIS MONTH $1 POSTPAID

5 Tiger jaws (Faucarias) as follows: *F. albidens, F. brittenae, F. lupina, F. superba, F. tuberculata.*

Californians include 3c stamp for tax, please.

Free illustrated catalogue

KNICKERBOCKER NURSERY
Rt. 3, San Diego, Calif.

CLOSE OUT OF EPIPHYLLUMS
CUTS at 20c each

Hermosus, hermosissimus, Col. Kuehnrich, Stern von Erlau, Wuertemberg, Aurantiacus superbus, Hans Rehm, Hofrat Bouche, The Lord, Sarah Courant, Madam Sallier, Antwerpia, Aurora, Franz Lehar, de Longpre (yellow striped), Schlesien, Triumph des anthieux, Martha Knebel, Otto Schmidt, Frau Dr. Ziegler, Frau Foldi Cvetnic, Prima Donna, Flor del sol, Empereur, Ernst Seyderhelm, Dante, Guedenay, Padre, A. V. Fric, Admiral Togo (a wide and curved leaf crenatus, my own), Paula Knebel, Friedrich Werner Beul, Francisco, Frau Johanna Attenhofer, Madam de Laet, Ferdinand Schmoll, Prof. Schindler, Dr. von Meyenburg, Etoile de Contich, Crenatus Dr. Rose, Blutrot, Knebels No. 52, Knebels No. 71, Knebels No. 72 (satin white-hanging), Knebels No. 49, Knebels No. 27, Knebels No. 212, German Empress, Autumn, Conways giant, Ferdinand Haage, German No. 5, Koening Humbert, Cooperi, Roseus superbus, Frau Ilse Hess, Anton Guenther, Pfersdorffii, Crenatus splendens.

CUTS at 35c each

Couranti, Tula, Luna, Phyllantoides grandiflorus, Germania, Gertrude Knebel, Horst Wessel, Friend Wegener, Ernst Udet, Curt Backeberg, Max Richter, Euphrosine (one of my favorites), Viviana, Fango, Sachsenland, Livingston, Camillo, Schneider, Lewerenz, Large Fire Red (my own), Otto Siepke, Rother's Saemling, Rother's cooperi, Bismarck, Nony von Tilburg, Franz Schubert, Curt Dormsch, Ceka.

CUTS at 50c each

Walter Haage, Frau Stanka Stozier, Dr. Jos. Goebbels, Knebels No. 59, Anna Bruennow, Graf Zeppelin.

Many young plants of various kinds at 25c and 35c.

Due to the low prices, no order for less than $2.00. Please remit postage and if a generous postage allowance is made we will send larger cuts.

My collection is open to the public on Sundays only. If the cuts ordered are not available, I will not substitute unless permitted to do so.

H. M. WEGENER
1190 Leighton Ave. Los Angeles, Calif.

ASK FOR FREE LIST
37 illustrations
FITZPATRICK'S CACTUS GARDENS
Rio Grande Valley
Edinburg, Texas

COMMERCIAL DEALERS

QAULITY HILLS CACTUS HOME
CACTUS AND SUCCULENTS
559 Evanston Ave. Kansas City, Mo.

FITZPATRICK'S CACTUS GARDENS
CACTUS
700 South Closner Blvd. Edinburg, Texas

R. W. POINDEXTER NURSERY
WHOLESALE GROWERS CACTI AND SUCCULENTS
1000 N. Temple St. Compton, Calif.

AND PLANTS
SUCCULENTS

Hundreds of rare species of seedling and large specimen plants. Ask for our illustrated plant catalog, also seed catalog. Cactus Seed—Amateur's Surprise Packet—100 mixed seed, easily grown species, carefully selected, 25c.

R. W. KELLY
2410 La Rosa Drive, Temple City, Calif.

12 large native cacti, botanically labelled, no two alike. $1.00 F.O.B. Eastland, Texas
EXOTIC PLANT CO.
Eastland, Texas

RIO GRANDE VALLEY CACTUS GARDEN
J. R. PIRTLE & SONS
Edinburg, Texas

Cereus childsii, cuts 4 in., 75c; 6 in., $1.00.
Lemaireocereus pruinosus, cuts 4 in., 25c; 6 in., 35c; 12 in., 50c.
L. stellatus, cuts 4 in., 25c; 6 in., 35c; 12 in., 50.
L. Beneckei, cuts 4 in., 25c; 6 in., 35c; 12 in., 50c.
L. hollianus, cuts 6 in., 50c; 9 in., 75c; 12 in., $1.00.
Rathbunia alamosensis, cuts 6 in., 35c; 9 in., 50c; 12 in., 80c.
Lophocereus Schottii, cuts 6 in., 60c; 12 in., $1.00.
L. australis, cuts 9 in., 75c; 12 in., $1.00.
Pachycereus marginatus, cuts 6 in., 50c; 9 in., 75c; 12 in., $1.00.
Myrtillocactus geometrizans, cuts 4 in., 25c; 6 in., 35c; 12 in., 80c.
M. cochal, cuts 6 in., 50c.
All above are mature cuts.
Ferocactus latispinus, red flowered, 5 in., 50c.
Ferocactus latispinus, yellow flowered, 5 in., 60c.
Mammillaria candida, 3 in., $1.00.
Astrophytum myriostigma, 1 in., 25c; 2 in., 50c; 3 in., $1.00; 4 in., $1.50.
A. asterias, 1 in., 20c; 2 in., 35c; 3 in., 50c; 4 in., 80c.
A. ornatum, 2 in., 50c; 3 in., $1.00.

1 each above, smallest size, $8.00 value for $6.00.
1 each above, largest size, $14.00 value for $10.00.
All prices f.o.b Edinburg. No order accepted for less than $1.00. Money refunded if not satisfied, purchaser to pay express charges one way. Mixed cactus seed

15 cents packet postpaid.

ASK FOR PRICE LIST